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RECORD OF ORAL HEARING
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex Parte HELEN O'HARA, DAVID STOW,
and DAVID EDWIN YATES

Appeal 2010-001147
Application 09/938,649
Technology Center 1700

Oral Hearing Held: July 21, 2010

Before CHARLES F. WARREN, PETER F. KRATZ, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

APPEARANCES:

ON BEHALF OF THE APPELLANT:

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1 The above-entitled matter came on for hearing Wednesday, July 21,
2 2101, commencing at 2:35 p.m., at the U.S. Patent and Trademark Office,
3 600 Dulany Street, Alexandria, Virginia, before Timothy J. Atkinson, Jr., a
4 Notary Public.

5 THE USHER: Calendar number 36, appeal number 2010-001147,
6 Mr. Compton.

7 JUDGE WARREN: Mr. Compton, good afternoon.

8 MR. COMPTON: Good afternoon.

9 JUDGE WARREN: Mr. Atkinson is our court reporter today. Please
10 present him with a business card or other suitable form of information about
11 yourself at the end of the hearing. And with that, sir, you have 20 minutes.
12 You may proceed when ready.

13 MR. COMPTON: Thank you. Good afternoon again. Eric Compton
14 on behalf of the Appellant Applicant. I'd like to begin this hearing with a
15 brief discussion of the prior art and the invention up to the Inventors
16 inventing it, and then I'd like to turn to the art rejection on appeal. For
17 reference, Claims 60 to 78 stand rejected under 102 (b) or, in the alternative,
18 under 103 (a) over McKenzie U.S. Patent number 5067876.

19 Turning now to the background of the art, this invention is related to
20 gassed emulsion explosive compositions and, in particular to an improved
21 composition thereof and method of manufacturing. These sorts of
22 compositions generally include an emulsion fuel blend. For example, water
23 and oil are meld in oil emulsion explosives in which an emulsifier is used to
24 help bond the aqueous and oil phases. In addition, in order to incorporate
25 voids and sensitize these emulsion compositions, chemical gassing is usually
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1 performed. This is needed to sensitize the emulsion composition for
2 ultimate detonation. Other techniques like physical techniques may be used,
3 but this invention does not necessarily concern them, at least with respect to
4 the independent claim. For the chemical gassing agents, generally nitrite-
5 gassing agents are typically used. When added to the emulsion, these agents
6 react under the acidity and perhaps accelerators provided in the emulsifier --
7 in the emulsion to produce nitrogen gas and thus form the voids.

8 The problems facing the art, though, are that using this conventional
9 process the nitrite gassing agents produces what is known as nitroso species.
10 They're a byproduct of the reaction. These nitroso species then attack head
11 groups of the emulsifier compounds. What this leads to is harmful effects
12 and discontinuous in the aqueous phase, as well as crystallization of the
13 oxidizer salts, degradation of the emulsifier, and possibly breakdown of the
14 emulsifier to separate aqueous inorganic or oil components which basically
15 makes the explosive unusable. Also, because of this problem, use of a
16 PIBSA -- that's an acronym that's mentioned in the Brief and in the claims --
17 is a derivative emulsifier that's generally used -- or is something that's --
18 people would like to use as stability in these products. However, this
19 particular molecule is attacked by these nitrosive species that are generated
20 with the conventional application of a gassing agent.

21 There's other problems in the art as well, including, I'll just briefly
22 mention, low densities, as well as getting the gassing agent properly
23 distributed in the emulsion.

24 So now turning to the invention, it was in light of these problems that
25 the Inventors developed this invention. Independent claim 60 is telling of
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1 the invention and captures it, I believe, pretty correctly. Basically, the first
2 step in this process is to create the gas or solution. This gas or solution
3 includes two, if not a third, element or ingredient. These include an
4 inorganic nitrite, an ammonium species, and optionally an accelerator. This
5 gas solution will be applied to an emulsion explosive composition. This in
6 turn includes a discontinuous aqueous phase comprising an inorganic
7 oxygen releasing salt, and a continuous water immiscible organic phase, and
8 a polyalkyl succinic acid anhydride based emulsifier. When the claimed gas
9 or solution is mixed with the emulsifier, droplets of the gas or solution are
10 distributed throughout this emulsifier explosive composition. At this time,
11 the inorganic nitrite and the ammonium species within those droplets react
12 which in turn creates gas bubbles. This reaction is believed to take place
13 solely within the droplets that are distributed in the emulsifier. Thus, the
14 gas is formed, but the reaction doesn't occur outside the droplets. Thus, the
15 emulsion and emulsifier basically protected from the aforementioned
16 drawbacks I said of the nitroso species in attacking the emulsifier head units.
17 So, this led to a number of benefits of the invention. Some include that there
18 was -- no emulsion breakdown was observed and it allowed for the use of
19 the PIBSA emulsifier which I said in the past had been vulnerable to this
20 nitroso species attacks. Also provided more long-term -- it prohibited
21 crystallization emulsion breakdown even in long-term, and it also allowed
22 to -- the compositions to be reduced in density. So, there was a number of
23 benefits that the claimed invention provided over the prior art.

24 Now turning to the sole reference, McKenzie, that was used in the two
25 rejections, the 102 and, alternative, the 103. McKenzie teaches -- its

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1 primary invention teaches using a surfacant [sic], which is used to stabilize a
2 mixture of emulsion and ammonium nitrate or fuel component of
3 ammonium nitrate fuel oil prills. These are basically explosive compounds
4 of these sort of compositions. As we will later, see this is a different
5 invention than the claimed invention. McKenzie does teach formation of an
6 oil in water emulsion, which is more similar to the claimed invention.
7 However, in discussing the invention, McKenzie teaches that the emulsion is
8 gassed and formed in a conventional manner, and specifically what this
9 included was taking an oxidizer salt, mixing it with the fuel and an
10 accelerator to create the emulsion. Later, a gassing agent such as sodium
11 nitrite is added to the solution to cause it to react to provide the gassed voids.
12 Again, the problem with this prior art in McKenzie is that by directly putting
13 the sodium nitrite gasser element directly in the emulsion, it leads to the
14 attack of certain aspects of the emulsifier elements.

15 So, what are the differences basically between McKenzie and the
16 claimed invention? Well, first of all with respect to step A, McKenzie does
17 not teach the claimed gassing solution having an inorganic nitrite and an
18 ammonium species and, optionally, an accelerator. As I have just
19 mentioned, there is no ammonium species that is provided with the gassing
20 agent in McKenzie that's separately mixed with the emulsion. And to the
21 extent there is an accelerator in McKenzie, and McKenzie does mention that
22 there's an accelerator, it's used in a different manner. So, in claim 1 it
23 mentions that the accelerator optional is part of the gassing solution, which
24 is mixed then with the emulsion to allow for this reaction in the droplets. In
25 McKenzie on the other hand, these accelerators are already preplaced,

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1 essentially in the emulsion along with the oxidizer salts. So for at least that -
2 -

3 JUDGE WARREN: But I think -- counselor, excuse me a minute.

4 MR. COMPTON: Sure.

5 JUDGE WARREN: Column 4, starting on line 33, I think does
6 combine a gassing agent along with the thiourea accelerator, along with the
7 oxidizer salt.

8 MR. COMPTON: Your Honor, that is the same misconception that
9 the Examiner drew from this. Essentially --

10 JUDGE WARREN: Well, it does say that you mix these together and
11 then that the thiourea and the oxidizer start to react as soon as they're mixed,
12 from column 4, lines 33 to about 44.

13 MR. COMPTON: I see that, Your Honor. In discussing those
14 elements or those ingredients in McKenzie, it is mentioned that the sodium
15 nitrite and the thiourea composition are part of the emulsion that's discussed
16 in column 4, beginning at line 4 down to line 11. It's also discussed in the
17 method of forming the emulsion, which begins at column 4, line 51, to the
18 following column 5 at column 8. So, essentially what McKenzie discusses
19 is preparing the emulsion first with that oxidizer salt --

20 JUDGE WARREN: I think it talks about preparing an oxidizer
21 solution which includes the oxygen providing salt as well as the gassing
22 agent and the thiourea. I don't see where in 33 to 44, that you have any
23 difference in that oxidizer solution that is combined with the ammonium
24 nitrate, prills and the fuel oil, as well as a surfacant and an emulsifier to form
25 the emulsion.

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1 MR. COMPTON: Okay. Again, to reiterate that passage beginning at
2 column 4, line 52, discusses the manner in which the emulsion and -- I
3 believe when they say emulsion, is the -- the composition is formed. So, it
4 says in part that the oxidizer salts and the aqueous soluble constituents, that
5 would be the aqueous phase aspect of the emulsion, are mixed with the fuel -
6 - the inorganic fuel and an emulsifier. Obviously those two components on
7 their own will not form a ready mixture, they'll separate. So, that that is the
8 purpose of the emulsifier, is to allow those two to basically mix in solution.

9 And then it says beginning -- so, the emulsion is essentially formed,
10 and, when it's time to gas, it specifically mentions when gassing is desired,
11 which could be immediately after the emulsion is formed and up to several
12 months thereafter when it is cooled to ambient or lower temperatures, the
13 gassing agent and other advantageous trace additives are added and mixed
14 homogenous throughout the emulsion to perform the uniform gassing at the
15 desired rate. So, although it mentions there may be trace additives added, it
16 makes no mention of what those may be. The term trace suggests that they
17 don't necessarily have a fundamental use. And going back to the earlier
18 aforementioned passage when it mentions the chemical gassing, it
19 specifically mentions that the sodium nitrite is -- reacts with the sodium
20 nitrite and the thiourea composition. So reading that, one would --

21 JUDGE WARREN: On the addition of a nitrite to the oxidizer
22 solution containing the thiourea.

23 MR. COMPTON: Yes. It's true that the oxidizer solution and the
24 thiourea, those are already in the emulsion solution at that point.

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1 JUDGE WARREN: No, I don't think so, because the emulsion
2 solution is formed using the oxidizer solution.

3 MR. COMPTON: Correct. The emulsion has the oxidizer solution,
4 which includes aqueous portions --

5 JUDGE WARREN: If you read -- or we even narrow it down further,
6 column 4, line 38, says "upon the addition of a nitrite to the oxidizer solution
7 containing the thiourea."

8 MR. COMPTON: Yes. Even if that -- even if we -- it is true that
9 when the nitrite is mixed with the -- or with the gassing agent in this case,
10 the sodium nitrite is mixed with the sodium nitrate thiourea composition, it
11 will begin to bubble because of the reaction of the nitrite in the oxidizer
12 solution. That is true. However, that's essentially the prior art reaction, I
13 mean. So, there are oxidizer salts solutions in the emulsifier, and that's the
14 reaction that this is referring to.

15 JUDGE WARREN: So, in other words, you do have a teaching there
16 of adding the nitrite to the oxidizer solution which include the nitrate -- I'm
17 sorry, adding the nitrite to the oxidizer solution which would contain the
18 nitrate.

19 MR. COMPTON: Yes.

20 JUDGE WARREN: Okay.

21 MR. COMPTON: So that's sort of an order of steps argument that the
22 -- I believe that the Examiner was trying to make. So, the idea is when we
23 take our -- the two active components of the gasser solution, which is the
24 inorganic nitrite and the ammonium species, when those are put together in
25 the gasser solution, they immediately start reacting. This can be at the same
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1 time or immediately before it's added to the emulsion solution, which also
2 includes these oxygen-releasing salts, the organic phase, as well as the
3 emulsifier, as well as the aqueous phase. What happens is, again, when this
4 is put in the solution, there's essentially -- because these chemicals are
5 already together, they form droplets. So, the -- included in those droplets,
6 small droplets is both the inorganic nitrite and the ammonium species.
7 Those have already -- essentially have begun started reacting. So, their
8 reaction takes place solely in a droplet or a distinct void, which then creates
9 the gas in that void. This is separate from any reaction that may occur
10 outside of it.

11 JUDGE WARREN: But if you have the nitrate and the nitrite in the
12 oxidizer solution of the reference, wouldn't you get the same reaction there?

13 MR. COMPTON: No.

14 JUDGE WARREN: Why?

15 MR. COMPTON: I strenuously disagree. In fact, we pointed this out
16 to the Examiner. This was discussed in the Appeal Brief, as well as in the
17 specification about this order of steps. So we discussed in the specification -
18 - just for the record it's on page 9, lines 26 to 31 -- drawbacks of this specific
19 separate addition of the inorganic and an ammonium species directly into the
20 emulsion explosion. It was found that this order of steps did not provide or
21 reduce the problems with the emulsion breakdown experience, and this is
22 believed because there's still a separate reaction between the emulsifier and
23 the nitrite-gassing agent at that point, because they're separately reacted into
24 the mixture. They may react, but worse off --

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1 JUDGE WARREN: You're adding an aqueous solution to the
2 combination of the prills and the fuel,. That aqueous solution contains the
3 nitrate, ammonium nitrate, the nitrite, the inorganic nitrite, as well as the
4 thiourea --

5 MR. COMPTON: In the prior art.

6 JUDGE WARREN: -- in the prior art right there.

7 MR. COMPTON: I disagree again with that characterization.

8 JUDGE WARREN: Well, I mean it says it.

9 MR. COMPTON: Again, it says when gassing is desired which could
10 be immediately after the emulsion is formed or up to several months after.
11 So, it's suggesting that the gassing agent is added after the emulsion is
12 formed which has those aqueous and oxidizer salts in it. So again, what is
13 happening in our invention and what the Applicant Inventors are seeking to
14 do is have the gassing element pre sort of mixed that's then added to the
15 emulsion solution so that these droplets can be formed. So, essentially you
16 have a droplet which has the two reactive components inside that droplet.
17 Those reactive components will react within that droplet, and it's believed
18 that that -- by having that sort of arrangement or microphysics there, that the
19 nitrite gassing agent of the gasser solution is not going to significantly react
20 with the emulsifier which is outside of that droplet. Having this -- the
21 scenario that McKenzie discusses, essentially has -- it has salts that can react
22 with a nitrite-gassing agent. When it's desired to gas that, the nitrite-gassing
23 agent is placed into the solution, which causes a reaction. However, because
24 they're not separately in a droplet form, the problems I mentioned with the
25 sort of reaction with the emulsifier take place, and I don't think -- I think we
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1 explained it in the spec. We mentioned that thing, and we're not claiming
2 that sequence that McKenzie has. We're explicitly claiming a new -- a novel
3 and inventive sequence in that, drawing upon this distinction. So, we
4 believe that the Examiner was in error for interpreting it that way.

5 That said, I think there's some other deficiencies with the Examiner's
6 position that are mentioned in the Brief. As I just said, I believe that the
7 Examiner did not give proper weight to our evidence of nonobvious. He just
8 merely says it's an obvious re-order of steps. I think that the evidence on the
9 record states that that's not the case and it was an error for the Examiner to
10 disregard the sequence of steps that's claimed. There's another issue with the
11 interpretation of the PIBSA molecule that's mentioned in McKenzie.

12 McKenzie specifically mentions that the surfacant that's used for mixing the
13 prills with the fuel element component, while we use the PIBSA, or the more
14 broader term independent claim -- the broader family which is known as
15 polyalkyl succinic acid anhydride for an emulsifier which one of ordinary
16 skill in the art would realize the bad emulsifier is used for bringing together
17 the aqueous phase in the oil or organic phase. It brings those two together.
18 In fact, McKenzie mentions both surfacants and emulsifiers, so there
19 shouldn't be any doubt of what McKenzie meant by the PIBSA surfacant.
20 It's not an emulsifier as used. In its enumeration of various emulsifiers, it
21 never mentions this specific family or the PIBSA being in there. So we
22 think that the Examiner was also in error for that.

23 Lastly, with regards to most of the dependent claims, there was a
24 number of parameters that were recited in specific ranges and amounts.
25 These included pH amounts, densities. The Examiner essentially said these
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1 were optimization arranges. We disagree because essentially, since the
2 Examiner has not set forth and the art does not show the claimed gasser
3 solution or the claimed emulsifier, nor their use together, that these
4 parameters are not just mere optimizations in the context of the invention.
5 Are there any further questions?

6 JUDGE WARREN: That's --

7 JUDGE KRATZ: It's your average stuff.

8 JUDGE WARREN: Thank you very much, counselor.

9 JUDGE KRATZ: Thank you.

10 MR. COMPTON: Thank you.

11 JUDGE WARREN: Have a good day.

12 Whereupon, the proceedings, at 3:00 p.m., were concluded.